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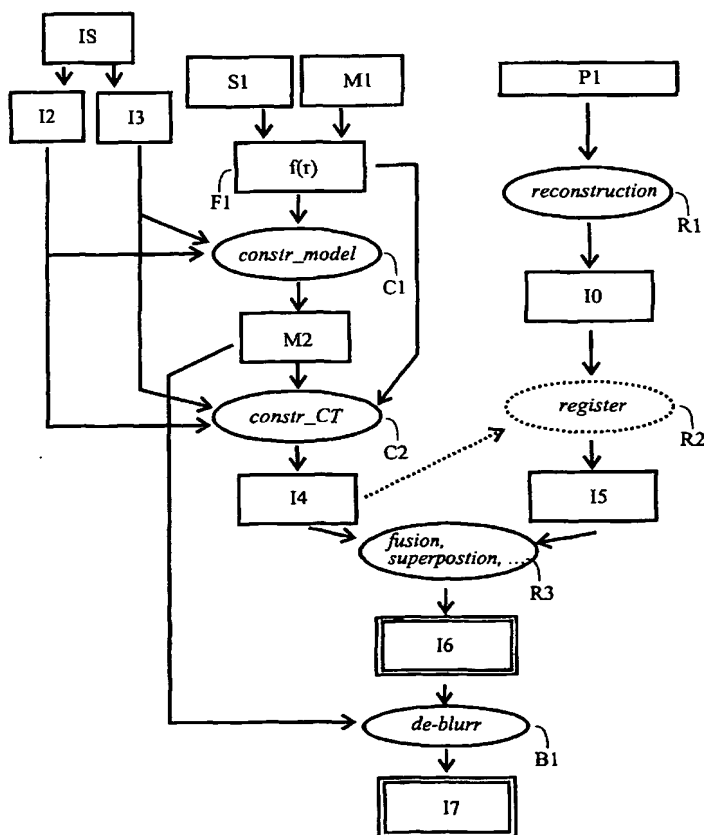
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[Continued on next page]

(54) Title: **MOTION ARTIFACT CORRECTION OF TOMOGRAPHICAL IMAGES**



(57) Abstract: The invention relates to a method in which the information contents of an image of a moving object is enhanced. The invention also relates to a system in which such a method can be carried out and to a computer program enabling a data processing unit to carry out such a method. The method is used notably in the field of medical imaging systems. According to the method first a first image of a moving object is acquired by means of a first imaging method, said image containing artifacts which are caused by the object motion. From two further images, acquired by means of a second imaging method and representing the object in a respective state of motion of the motion, there is formed a motion model which is implemented in a different manner in image processing or image forming steps, so that the information contents of either the first image or a combination image, formed from the first image and the two further images, is enhanced.

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MX, MZ, NI, NO, NZ, OM, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.

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# INTERNATIONAL SEARCH REPORT

nal Application No

/IB 03/03011

A. CLASSIFICATION OF SUBJECT MATTER  
IPC 7 G06T5/00 G06T7/20

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)  
IPC 7 G06T

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal, INSPEC, WPI Data

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

| Category * | Citation of document, with indication, where appropriate, of the relevant passages  | Relevant to claim No. |
|------------|---|-----------------------|
| A          | <p>HEDLEY M ET AL: "MOTION ARTIFACT SUPPRESSION: A REVIEW OF POST-PROCESSING TECHNIQUES"<br/>MAGNETIC RESONANCE IMAGING, TARRYTOWN, NY, US,<br/>vol. 10, no. 4, July 1992 (1992-07), page 627, XP008022707<br/>ISSN: 0730-725X<br/>abstract<br/>section "motion artifacts", 1st paragraph<br/>section "motion models"<br/>section "model parameter estimation"<br/>section "data correction"</p> <p style="text-align: center;">-----<br/>-/-</p> | 1,3-7,<br>9-12        |

☒ Further documents are listed in the continuation of box C.

☐ Patent family members are listed in annex.

### \* Special categories of cited documents :

- "A" document defining the general state of the art which is not considered to be of particular relevance
- "E" earlier document but published on or after the international filing date
- "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- "O" document referring to an oral disclosure, use, exhibition or other means
- "P" document published prior to the international filing date but later than the priority date claimed

- "T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
- "X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
- "Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.
- "&" document member of the same patent family

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## C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

| Category * | Citation of document, with indication, where appropriate, of the relevant passages   | Relevant to claim No. |
|------------|--|-----------------------|
| A          | <p>MATTES D ET AL: "NONRIGID MULTIMODALITY IMAGE REGISTRATION"<br/>           PROCEEDINGS OF THE SPIE, SPIE, BELLINGHAM, VA, US,<br/>           vol. 4322, 19 February 2001 (2001-02-19),<br/>           pages 1609-1620, XP008021029<br/>           ISSN: 0277-786X<br/>           cited in the application<br/>           abstract<br/>           page INT<br/>           section 2.1.</p>   | 1,3-7,<br>9-12        |
| A          | <p>-----<br/>           KATSAGGELOS A K: "ITERATIVE IMAGE RESTORATION ALGORITHMS"<br/>           OPTICAL ENGINEERING, SOC. OF PHOTO-OPTICAL INSTRUMENTATION ENGINEERS. BELLINGHAM, US,<br/>           vol. 28, no. 7, 1 July 1989 (1989-07-01),<br/>           pages 735-748, XP000033800<br/>           ISSN: 0091-3286<br/>           cited in the application<br/>           section 1.<br/>           section 2.1.-2.2.<br/>           -----</p> | 1,3-7,<br>9-12        |

# INTERNATIONAL SEARCH REPORT

national application No.  
PCT/IB 03/03011

## Box I Observations where certain claims were found unsearchable (Continuation of item 1 of first sheet)

This International Search Report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:  
because they relate to subject matter not required to be searched by this Authority, namely:
  
2. ☐ Claims Nos.:  
because they relate to parts of the International Application that do not comply with the prescribed requirements to such an extent that no meaningful International Search can be carried out, specifically:
  
3. ☐ Claims Nos.:  
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

## Box II Observations where unity of invention is lacking (Continuation of item 2 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

see additional sheet

1. ☐ As all required additional search fees were timely paid by the applicant, this International Search Report covers all searchable claims.
  
2. ☐ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
  
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this International Search Report covers only those claims for which fees were paid, specifically claims Nos.:
  
4. ☒ No required additional search fees were timely paid by the applicant. Consequently, this International Search Report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

1,3,5-7,clms4

9 when depending on clm 1 or 3 and clms10-12 when corresponding to clm 1 or 3.

Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest.
- ☐ No protest accompanied the payment of additional search fees.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. claims: clms 1, 3, 5-7, clms 4, 9 when depending on clm 1 or 3  
and clms 10-12 when corresponding to clm  
1 or 3

image deblurring based on motion blurred image simulation  
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2. claims: clm 2, clms 4, 9 when depending on clm 2 and clms 10-12  
when corresponding to clm 2

local motion models  
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3. claim: clm 8

image fusion  
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